

CLAIMS

What is claimed is:

- 5 1. A composition for enhancing the introduction efficiency of a target substance into a cell, comprising a cellular adhesion related agent.
2. A composition for enhancing the introduction
10 efficiency of a target substance into a cell according to claim 1 wherein the cellular adhesion related agent comprises an interaction substance interacting with a cellular adhesion molecule.
- 15 3. A composition according to claim 2, wherein the cellular adhesion molecule is an extracellular matrix.
4. A composition according to claim 2, wherein the cellular adhesion molecule is an integrin receptor.
- 20 5. A composition according to claim 2, wherein the cellular adhesion molecule comprises an RGD molecule.
6. A composition according to claim 2, wherein the
25 interaction molecule raises an antigen-antibody reaction with a partner of the cellular adhesion molecule.
7. A composition according to claim 2, wherein the interaction molecule is an antibody or a derivative thereof.
- 30 8. A composition according to claim 2, wherein the interaction molecule is a monoclonal or polyclonal antibody.

9. A composition according to claim 2, wherein the interaction molecule comprises an antibody selected from the group consisting of an anti-CD49a antibody, an anti-CD49b antibody, an anti-CD49c antibody, an anti-CD49e antibody, and an anti-CD49f antibody.

10. A composition according to claim 1, wherein the target substance comprises a genetic material.

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11. A composition according to claim 1, wherein the target substance comprises a nucleic acid molecule.

12. A composition according to claim 1, wherein the target substance comprises DNA.

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13. A composition according to claim 4, wherein the integrin receptor is selected from the group consisting of CD49a, CD49b, CD49c, CD49d, CD49e, CD49f and CD29.

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14. A composition according to claim 4, wherein the integrin receptor is selected from the group consisting of CD29, CD49a, CD49c, Cd49d, CD49e and CD49f.

15. A composition according to claim 4, wherein the intergrin receptor interacts with a molecule selected from the group consisting of collagen, fibronectin, vitronectin and laminin.

16. A composition according to claim 1, wherein the cell comprises at least one cell selected from the group consisting of a stem cell and a differentiated cell.

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17. A composition according to claim 1, wherein the cellular adhesion molecule is specifically expressed in the cell.
- 5 18. A composition according to claim 1, wherein the target substance is a genetic material and the composition further comprises a gene introduction reagent.
- 10 19. A composition according to claim 18, wherein the gene introduction reagent is selected from the group consisting of a cationic macromolecule, cationic lipid and calcium phosphate.
- 15 20. A composition according to claim 1, further comprising a particle.
21. A composition according to claim 20, wherein the particle comprises a gold colloid.
- 20 22. A composition according to claim 1 further comprising a salt.
- 25 23. A composition according to claim 22, wherein the salt is selected from the group consisting of salts comprised in a buffer and salts comprised in media.
24. A kit for enhancing gene introduction efficiency, comprising:
- 30 (a) a cellular adhesion related agent; and
(b) a gene introduction reagent.
25. A composition for introducing a target material to a cell, comprising:

- (A) a target material; and
- (B) a cellular adhesion related agent.

26. A composition according to claim 25, wherein the
5 target material comprises a substance selected from the
group consisting of DNA, RNA, polypeptide, sugar and a
complex thereof.

27. A composition according to claim 25, wherein the
10 target material comprises a DNA encoding a gene sequence
to be transfected into the cell.

28. A composition according to claim 25 further comprising
a gene introduction reagent.

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29. A composition according to claim 25, wherein the
cellular adhesion related agent comprises an interaction
substance interacting with a cellular adhesion molecule.

20 30. A composition according to claim 25, wherein the
cellular adhesion related agent comprises an antibody to
a cellular adhesion molecule.

31. A composition according to claim 25 which is present
25 as a liquid phase.

32. A composition according to claim 25 which is present
as a solid phase.

30 33. A device for enhancing gene introduction efficiency
of a target molecule into a cell, comprising:
(a) a target molecule; and
(b) a cellular adhesion related agent,

wherein the cellular adhesion related agent is immobilized onto a support.

5 34. A device according to claim 33, wherein the target substance comprises a substance selected from the group consisting of DNA, RNA, polypeptide, sugar and a complex thereof.

10 35. A device according to claim 33, wherein the target substance comprises a DNA encoding a gene sequence for the purpose of gene expression.

15 36. A device according to claim 33, further comprising a gene introduction reagent.

37. A device according to claim 36, wherein the cellular adhesion related agent comprises an interaction substance interacting with a cellular adhesion molecule.

20 38. A device according to claim 36, wherein the cellular adhesion related agent comprises an antibody against a cellular adhesion molecule.

25 39. A device according to claim 36, wherein the support is selected from the group consisting of a plate, a microwell plate, a tip, a slide glass, a film, a bead and metal.

40. A device according to claim 36, wherein the support is coated with a coating agent.

30 41. A device according to claim 40, wherein the coating agent comprises a substance selected from the group consisting of poly-L-lysine, silane, MAS, hydrophobic

fluorine resin and metal.

42. A method for enhancing the introduction efficiency of a target substance into a cell, comprising the steps of:

- 5 A) providing a target substance;
 B) providing a cellular adhesion related agent; and
 C) contacting the target substance and the cellular adhesion related substance with the cell.

10 43. A method according to claim 42, wherein the target material comprises a substance selected from the group consisting of DNA, RNA, polypeptide, sugar and a complex thereof.

15 44. A method according to claim 43, wherein the target material comprises a DNA encoding a gene sequence to be transfected in the cell.

20 45. A method according to claim 42, further comprising a gene introduction reagent.

25 46. A method according to claim 42, wherein the cellular adhesion related agent comprises an interaction substance interacting with a cellular adhesion molecule.

 47. A method according to claim 42, wherein the cellular adhesion related agent comprises an antibody to a cellular adhesion molecule.

30 48. A method according to claim 46, wherein the cellular adhesion molecule is an extracellular matrix molecule.

 49. A method according to claim 42, wherein the method is

conducted in a liquid phase.

50. A method according to claim 42, wherein the method is conducted in a solid phase.

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51. A method for enhancing the introduction efficiency of a target substance into a cell, comprising the steps of:

I) immobilizing a composition comprising

A) a target substance, and

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B) a cellular adhesion molecule

onto a support; and

II) contacting a cell to the composition on the support.

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52. A method according to claim 51, further comprising the step of providing a gene introduction reagent, said gene introduction reagent being contacted with the cell.

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53. A method according to claim 52, further comprising the step of forming a complex between the target substance and a gene introduction reagent after the provision thereof, wherein thereafter the cellular adhesion related agent is provided.

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54. A method according to claim 51, wherein the cellular adhesion related agent comprises an interaction substance interacting with a cellular adhesion molecule.